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IRSA's New Look: Design Considerations

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Abstract. The NASA/IPAC Infrared Science Archive (IRSA) undertook a major upgrade to its website and user experience this year. The work was motivated by the need to facilitate access to a growing number of astronomical data sets and exploration tools. The guiding principle of the redesign was to focus on the most important items, while providing easy access to the full set of IRSA's holdings and services. We discuss the redesign process and the key features of the new website.

1. The NASA/IPAC Infrared Science Archive (IRSA)

IRSA (irsa.ipac.caltech.edu) is the infrared component of the NASA archives. It is chartered to (1) curate and serve scientific data products from NASA's infrared (IR) and submillimeter projects; (2) enable scientific exploration of these data sets; and (3) support planning for, operation of, and data set generation from NASA missions.

In the past few years, IRSA underwent a major expansion from holdings dominated by the Infrared Astronomical Satellite (IRAS; Neugebauer et al. 1984) and the Two Micron All Sky Survey (2MASS; Skrutskie et al. 2006) to a much broader portfolio. Recent additions include the Heritage Archive (SHA) of the Spitzer Space Telescope (Werner et al. 2004); the Wide-Field Infrared Survey Explorer (WISE; Wright et al. 2010); NASA's Planck Archive (Planck Collaboration et al. 2011); and seamless access to ESA's Herschel Science Archive. The increased complexity of serving many heterogenous mission data sets, along with a large number of new users, strained the previous website and required a serious reworking of the design.

2. The Old Look

Leading into the years of rapid expansion, IRSA's web site was designed to be simple and robust. The emphasis was placed on presenting as much information as possible while minimizing mouse clicks. The two dominant menus (top and left-side, see Figure 1) were present on most static IRSA pages. A combined menu was offered on pages dedicated to visualization-intensive services.

The IRSA front page highlighted additional information: news, external links, and featured images. In addition, the first items in the main frame were a search box to access IRSA's Inventory Search, and a short statement describing the archive itself.

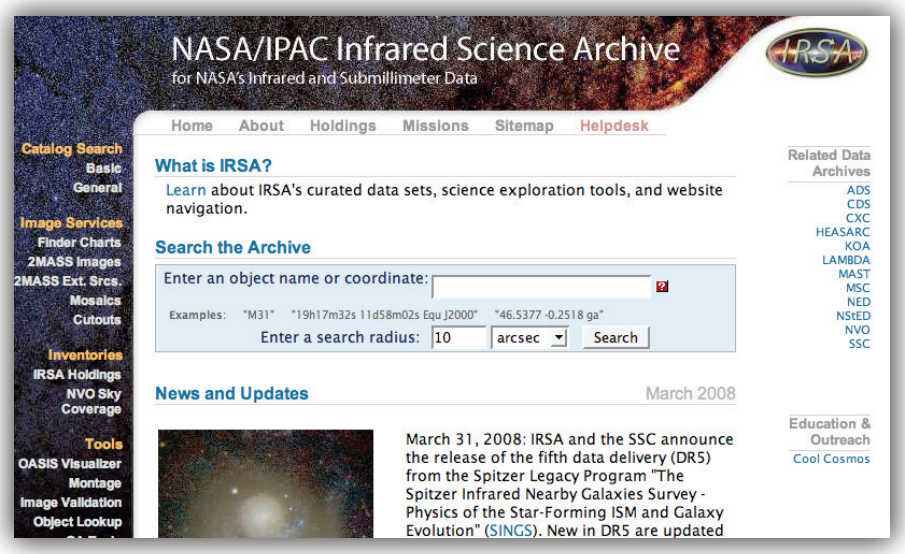

Figure 1. The old website was characterized by two menus providing access to a variety of data services and tools, a data discovery search box, news, external links, and featured images. As the archive and user base grew, this "everything at your fingertips" approach became overly complex, motivating a change in design.

3. Rethinking the Philosophy

IRSA partnered with the IPAC Communications and Education Team (ICE)[1] to simplify the design of the website without sacrificing functionality. ICE is a unique team of scientists and science-savvy developers that has developed websites for PTF, NuSTAR, NExScI, and more.

The first step was to understand the needs of IRSA's users. A usage study was conducted using Google Analytics, software that tracks how visitors interact and travel through a website. Scientific use cases were developed by IRSA scientists based on knowledge of the literature. Finally, feedback from the wider community of scientists was gathered from both the IRSA Help Desk and from a user survey conducted at the end of 2012.

The second step was for ICE designers to translate this understanding of user needs into a design, taking into account the modern expectations of web users. Developers and scientists iterated to reach a design that (1) was simple for new users to learn; (2) did not alienate or sacrifice functionality for veteran users; and (3) inspired trust in the data and services behind the scenes.

The third step was to implement the design in a way that meshed seamlessly with IRSA's back-end services, so that IRSA could maintain and update the website independently.

[1] `http://ice.ipac.caltech.edu`

Figure 2. The new website features a compact, comprehensive, text-based menu, as well as visually-intuitive iconographic menus for the most popular tools (red) and data sets (blue). News and Featured Images are combined so users have only one place to look for changes. Google Analytics revealed that Catalog Searches are extremely popular, so a search box was added to allow this directly from the front page. Help is prominent on the top and bottom of the page.

Figure 3. (*left*) The complex menu of Spitzer Heritage Archive content; (*right*) The mission information page for Spitzer.

4. The New Look

The new website features an "app driven" layout, which is familiar to modern users of smart phones and tablets (see Figure 2). Simple and consistent iconography makes navigation intuitive. User research guided decisions on which services and data sets to put in front of the user, and which could be placed a logical click or two away. For users of more obscure items, the top of the frame presents the centralized text-based menu. Below the menu are the five major areas of content:

Search: In addition to the Inventory Search provided in the previous design, the new page also offers front-page access to the Catalog Search Service, our most popular tool.

Data Services: The multi-mission and non-mission data services are accessed through red icons that are used consistently throughout the website.

Major Missions: Blue icons link to information pages for major missions. These compile links to all relevant IRSA holdings and external sites, the most important of which are represented as icons at the top of the page (Figure 3, right).

News and Featured Images: This section is dynamic to reflect both the changing nature of its content and to keep its screen footprint compact. News items and images rotate through at a slow pace (once per minute). Older items are available from links in the same area.

Help: At the bottom of the main frame are prominent links to documentation, demos, and the helpdesk.

Footer: Below the major areas is the site footer, with a site-search, institutional logos, and links to the Acknowledgement statement and contact info.

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